REDUCING STICTION IN A MEMS DEVICE WITH AN APPLIED FORCE

ABSTRACT OF THE DISCLOSURE

A method is disclosed for operating a MEMS device having a flap that is movable with respect to a base. The method includes applying a force to the flap to move the flap at least partially out of contact with an underlying base. Means for applying such a biasing force may be incorporated into a microelectromechanical (MEMS) apparatus having a base and a flap with a portion coupled to the base so that the flap may move out of the plane of the base between first and second position. The base may have a cavity with largely vertical sidewalls that contact a portion of the flap when the flap is in the second position Electrodes may be placed on the vertical sidewalls and electrically isolated from the base to provide electrostatic clamping of the flap to the sidewall. The base may be made from a substrate portion of a silicon-on-insulator (SOI) wafer and the flap defined from a device layer of the SOI wafer. The flap may be connected to the base by one or more flexures such as torsional beams. An array of one or more of such structures may be used to form an optical switch.